



**Directorate of  
Intelligence**

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# **Science and Weapons Daily Review**

**Thursday**

**7 June 1984**

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25X1

CONTENTS

7 JUNE 1984

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- 1 USSR: DESIGNERS OF THE ASTRON SPACECRAFT  
IDENTIFIED [redacted]

25X1

Recently [redacted] identified several organizations and individuals associated with the Astron spacecraft, launched last year, which carried the world's largest ultraviolet space telescope and a high-precision pointing and tracking system; the new information leads us to believe that the Utkin organization was responsible for systems integration of Astron.

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- 3 USSR: ES-1036 MAINFRAME IDENTIFIED AS RYAD-3  
COMPUTER [redacted]

25X1

A recent Soviet export brochure states that the ES-1036 represents the first stage of developing Ryad-3 computers; the brochure is our first confirmed association of a specific computer model with the long-awaited next generation of Soviet mainframes--Ryad-3. [redacted]

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25X1

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5

CHINA: LASER FUSION PROGRAM STAGNATING

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A recent visitor to the Shanghai Institute of Optics and Fine Mechanics toured the Chinese six-beam laser fusion system and confirmed that the Chinese have had problems using all six beams simultaneously; because of the problems, China's laser fusion program is unlikely to contribute significantly to the domestic energy or nuclear weapons programs in the foreseeable future.

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## **Science and Weapons Daily Review**

USSR: DESIGNERS OF THE ASTRON SPACECRAFT IDENTIFIED [redacted]

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Recently uncovered [redacted] the identity of several organizations and at least two individuals associated with the Astron spacecraft. Astron, which was launched early last year, carried the world's largest ultraviolet space telescope, SPIKA, and a high-precision pointing and tracking system. Its mission was to conduct astrophysical research on the sources of cosmic radiation. Astron is similar to Venera-15 and Venera-16--Venus spacecraft that were launched in June 1983. The Soviet press described the latter as a "new generation" of Venus spacecraft. [redacted]

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The individuals newly associated with the design and development of Astron by Soviet press sources are V. G. Kurt, Chief of the Ultraviolet and X-ray Astronomy Laboratory at the Institute of Space Research in Moscow, and A. A. Boyarchuk, Deputy Director of the Crimean Astrophysics Observatory and reportedly director of the SPIKA project. Unidentified Armenian organizations reportedly designed a system for precision orientation of Astron and worked with the French Laboratoire D'Astronomie Spatiale in Marseilles on a "sky recognition camera." The Soviet press additionally noted that Astron incorporates "the talent and work of the Ukraine." [redacted]

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Comment:

We believe that the Utkin organization, which is colocated with the Southern Machine Building Plant 186 in Dnepropetrovsk, was responsible for systems integration of Astron. Our belief is based on the similarities between

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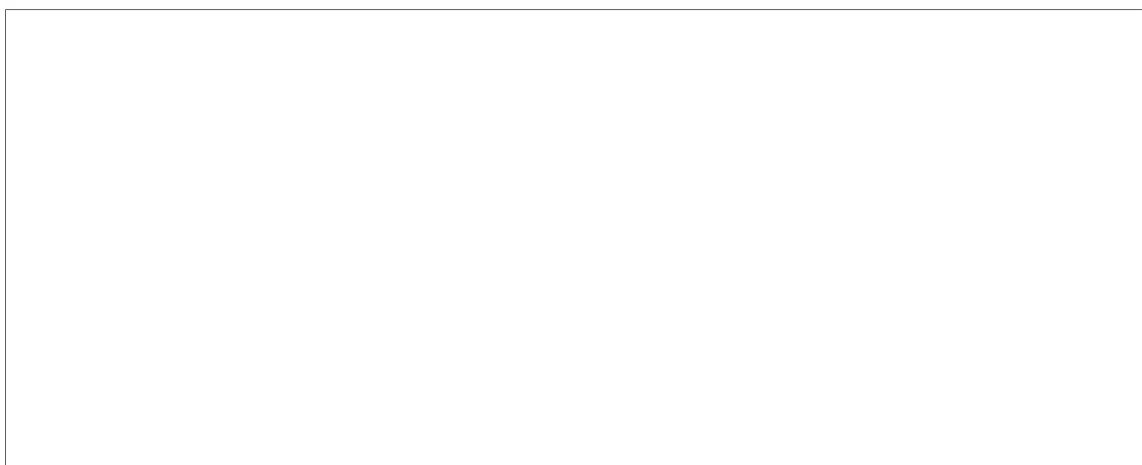
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Astron and Venera-15 and Venera-16, which are firmly associated with Utkin [redacted]

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Furthermore, the attribution of R&D work on Astron to the Ukraine possibly is a reference to Utkin, which is the only integrating contractor for space systems located in that region of the USSR. [redacted]

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USSR: ES-1036 MAINFRAME IDENTIFIED AS RYAD-3 COMPUTER

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A recent Soviet export brochure states that the ES-1036 mainframe "represents the first stage of developing Ryad-3 computers."

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Comment:

The brochure [redacted] confirmed association of a specific Soviet computer model with the long-awaited next generation of Soviet mainframes--Ryad-3. The brochure also substantiates our earlier belief, which was based on a 1981 Soviet publication, that the ES-1036 would be a member of the Ryad-3 family.

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According to the recent brochure, the ES-1036 can execute up to 400,000 operations per second, has a main memory of 2 to 4 megabytes, and a buffer (cache) memory of unspecified size. The ES-1036 is expected to represent the low-performance end of the family of Soviet Ryad-3 mainframes. The Ryad-1 and Ryad-2 series of Soviet computers were modeled after the IBM System/360 and System/370 architecture, respectively. The logical progression would be for low-performance Ryad-3 computers to follow the IBM-4300 family of computers introduced in the United States in 1979; however, there currently is insufficient information on the ES-1036 to confirm that this is the case.

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[redacted] (VM is a multiple-access operating system that creates the illusion that each user can have a unique computer configuration. VM multiprogramming systems can create virtual processors, storage, and input/output devices, possibly with much larger capacities than those on the actual underlying machine.) The VM/370 operating system was introduced by IBM in 1972 for its System/370 line.

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The ES-1036 brochure lists the size of the assembly-language instruction set as 220. This number is larger in size than standard IBM instruction sets, and may indicate that the ES-1036 is a copy of a non-Communist version of an IBM machine, such as Hitachi or Fujitsu of Japan.

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CHINA: LASER FUSION PROGRAM STAGNATING

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A recent visitor to the Shanghai Institute of Optics and Fine Mechanics toured the Chinese six-beam laser fusion system. The system produces 10 joules of energy per beam and has been operational since 1980. The Chinese, however, have had problems in using all six beams simultaneously, and generally have used only one or two beams at a time to implode glass microballoon targets.

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Comment:

The Chinese laser fusion program, which consists primarily of the project at the Shanghai Institute of Optics and Fine Mechanics, has made little progress in recent years. In addition, there are no indications that the situation is likely to change in the near future. As a result, it is unlikely that the laser fusion program will make any significant contributions to the Chinese energy or nuclear weapons programs in the foreseeable future.

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25X1

7 JUNE 1984

SW SWDR 84-110

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